PATENT

Attorney Docket No. SIC-04-021

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re reissue application of:
KANJI KIRIMOTO, et al
Application No.: 10/826,173
Filed: April 16, 2004
For: CABLE DISK BRAKE

Examiner: Thomas J. Williams
Art Unit: 3683

RESPONSE TO REQUEST FOR ADDITIONAL BRIEFING

Commissioner for Patents
P.O. Box 1450
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Commissioner:

This is a response to the request for additional briefing mailed March 10, 2009.

POINT (1)

(1) Reproduction of all claims of U.S. Patent No. 6,557,671 B1

1. A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) in an axial direction from said release position

towards said second friction member (32) to said braking position (col. 6:16-19), said actuated mechanism (34, 36) including

an input cam ((90), Fig. 5, col. 8:49-52) movably mounted within said caliper housing (30) to move in a rotational direction about a longitudinal axis (col. 8:56-61), but not in an axial direction (because input cam (90) is one-piece and is axially immovably fastened to caliper housing (30) via nut (97) as shown in Fig. 5), said input cam having a first camming surface ((90d), Fig. 31, col. 8:65-67) with an axially extending guide member ((90c), Fig. 5, col. 8:62-65) non-movably fixed thereto at said longitudinal axis (because input cam (90), including guide member (90c), is one-piece as shown in Fig. 5), and

an output cam ((91), Fig. 5, col. 8:49-52) movably mounted within said caliper housing (30) to move in the axial direction in response to rotation of said input cam (30) (col. 9:32-37), but not in the rotational direction (col. 9:44-48), said output cam having a second camming surface ((91c), Fig. 35, col. 9:30-32) with an axially extending bore ((91e), Fig. 34, col. 9:38-41), said guide member (90c) being at least partially disposed within said bore (91e) (Fig. 5, col. 9:38-41) to ensure smooth relative movement between said input and output cams (90, 91) (col. 9:24-27).

2. A cable disc brake (12a) according to claim 1, wherein said guide member (90c) is formed by a pin ((90c), Fig. 5, col. 8:62-65) extending from said input cam (90) into said bore (91e) of said output cam (91) (Fig. 5, col. 9:38-41).

3. A cable disc brake (12a) according to claim 2, wherein said pin (90c) is integrally formed with said input cam (90) (as shown in Fig. 5).

4. A cable disc brake (12a) according to claim 2, wherein said first camming surface (90d) of said input cam (90) has a set of first camming slots ((90e) Fig. 31, col. 8:65-67), said second camming surface (91c) of said output cam (91) has a set of second camming slots ((91d), Fig. 35, col. 9:32-37) with rolling members ((92), Fig. 5, col. 8:65-67) located between said first and second camming slots (90e, 91d) (col. 8:65-67; col. 9:32-37).

5. A cable disc brake (12a) according to claim 4, wherein said rolling members (92) are balls (col. 8:65-67) and said first and second camming slots (90e, 91d) are circumferentially extending ramp-shaped slots (col. 8:67 - col. 9:6; col. 9:33-37).

6. A cable disc brake (12a) according to claim 1, wherein said actuated mechanism (34, 36) further includes an actuating arm ((98), Fig. 5, col. 10:17-20) operatively coupled to said input cam (90) (col. 10:20-22).

7. A cable disc brake (12a) according to claim 6, wherein said actuating arm (98) is biased to a release position by a biasing member ((99), Fig. 5, col. 11:12-14).

8. A cable disc brake (12a) according to claim 7, wherein said biasing member (99) is a torsion spring (col. 10:46-49) with a first end ((99b), Fig. 50, col. 10:46-49) coupled to said caliper housing (30) (col. 10:49-52) a second end ((99c), Fig. 50, col. 10:46-49) coupled to said actuating arm (98) (col. 10:49-52).

9. A cable disc brake (12a) according to claim 8, wherein said actuated mechanism (34, 36) includes a return spring ((93), Fig. 5, col. 8:49-52) arranged to bias said first and second cam members (90, 91) together (col. 9:65 - col. 10:1).

10. A cable disc brake (12a) according to claim 9, wherein said actuating arm (98) has a cable attachment member ((104), Fig. 4, col. 10:34-37) thereon.

11. A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) from said release position towards said second

friction member (32) to said braking position (col. 6:16-19), said actuated mechanism (34, 36) having first and second cam members ((90, 91), Fig. 5, col. 8:49-52) movably arranged between an axially retracted position and an axially extended position (col. 8:53-61) with a guide member ((90c), Fig. 5, col. 8:62-65) interconnecting said first and second cam members (90, 91) (col. 9:38-41) during movement between said axially retracted position and said axially extended position (col. 9:41-44), said guide member (90c) being non-movable in the axial direction relative to said caliper housing (30) (because input cam (90) is one-piece and is axially immovably fastened to caliper housing (30) via nut (97) as shown in Fig. 5);

said first cam member (90) being rotatably mounted within said caliper housing (30) (col. 8:56-61), but non-movably mounted in the axial direction (because input cam (90) is one-piece and is axially immovably fastened to caliper housing (30) via nut (97) as shown in Fig. 5), and said second cam member (91) being movably mounted in the axial direction (col. 9:32-37) but non-rotatably mounted (col. 9:44-48).

12. A cable disc brake (12a) according to claim 11, wherein said guide member (90c) is formed by a pin ((90c), Fig. 5, col. 8:62-65) extending from one (90) of said first and second cam members (90, 91) into a bore (91e) of the other (91) of said first and second cam members (90, 91) (Fig. 5, col. 9:38-41).

13. A cable disc brake (12a) according to claim 12, wherein said pin (90c) is located along an axis of rotation of said first and second cam members (90, 91) (Fig. 5, col. 9:24-27).

14. A cable disc brake (12a) according to claim 13, wherein said actuated mechanism (34, 36) further includes an actuating arm ((98), Fig. 5, col. 10:17-20) coupled to said first cam member (90) (col. 10:20-22).

15. A cable disc brake (12a) according to claim 14, wherein said actuating arm (98) is biased to a release position by a biasing member ((99), Fig. 5, col. 11:12-14).

16. A cable disc brake (12a) according to claim 15, wherein said biasing member (99) is a torsion spring ((99), col. 10:46-49) with a first end ((99b), Fig. 50, col. 10:46-49) coupled to said

caliper housing (30) (col. 10:49-52) a second end ((99c), Fig. 50, col. 10:46-49) coupled to said actuating arm (98) (col. 10:49-52).

17. A cable disc brake (12a) according to claim 16, wherein said actuated mechanism (34, 36) includes a return spring ((93), Fig. 5, col. 8:49-52) arranged to bias said first and second cam members (90, 91) together (col. 9:65 - col. 10:1).

18. A cable disc brake (12a) according to claim 17, wherein said actuating arm (98) has a cable attachment member ((104), Fig. 4, col. 10:34-37) thereon.

19. A cable disc brake (12a) according to claim 11, wherein said first cam member (90) has a set of first camming surfaces ((90d), Fig. 31, col. 8:65-67), said second cam member has a set of second camming surfaces ((91c), Fig. 35, col. 9:30-32) with rolling members ((92), Fig. 5, col. 8:65-67) located between said first and second camming surfaces (90d, 91c) (col. 8:65-67; col. 9:32-37)

20. A cable disc brake (12a) according to claim 19, wherein said rolling members (92) are balls (col. 8:65-67) and said first and second camming surfaces (90d, 91c) include ramp-shaped slots (col. 8:67 - col. 9:6; col. 9:32-37).

21. A cable disc brake (12a) according to claim 1, wherein said input cam (90) includes a first cam member ((90a), Fig. 29, col. 8:62-65) disposed within an internal bore ((46), Fig. 12, col. 6:42-46) of said caliper housing (30) (as shown in Fig. 5).

22. A cable disc (12a) brake according to claim 21, wherein said input cam (90) further includes an operating shaft ((90b), Fig. 29, col. 8:62-65) that extends axially from said first cam member (as shown in Fig. 5), and said operating shaft (90b) is operatively coupled to an actuating arm ((98), Fig. 5, col. 10:20-22).

23. A cable disc brake (12a) according to claim 22, wherein said operating shaft (90b) at least partially extends outwardly from said caliper housing (30) (as shown in Fig. 5), and said actuating arm (98) is disposed on an opposite side of said caliper housing (30) from said internal bore (46) of said caliper housing (30) (as shown in Fig. 5).

24. A cable disc brake (12a) according to claim 22, wherein said input cam (90) further includes a bushing ((96), Fig. 5, col. 8:49-52) mounted on said operating shaft (90b) of said input cam (90) (Fig. 5, col. 9:16-17).

25. A cable disc brake (12a) according to claim 24, wherein said bushing (96) includes a cylindrical portion at least partially surrounding said operating shaft (90b) (Fig. 5, col. 9:16-17) and a flange portion (shown in Fig. 5) extending from said cylindrical portion, and said flange portion is located axially between a portion of said input cam (90) and said caliper housing (30) within said internal bore (46) of said caliper housing (30) (as shown in Fig. 5).

26. A cable disc brake (12a) according to claim 21, wherein said output cam (91) includes a second cam member ((91a), Fig. 34, col. 9:28-30) with a non-circular thrust shaft ((91b), Fig. 34, col. 9:28-30; col. 9:44-48) extending axially therefrom, and said thrust shaft (91b) is received in a non-circular hole ((94b), Fig. 39, col. 9:49-53) of a rotation stopper ((94), Figs. 5 and 39, col. 9:49-53).

27. A cable disc brake (12a) according to claim 26, wherein said rotation stopper (94) includes a radially extending tab ((94c), Fig. 39, col. 9:53-55) that is received in an axial slot ((65), Fig. 9, col. 7:12-15) of said caliper housing (30) to prevent rotation of said rotation stopper (94).

28. A cable disc brake (12a) according to claim 27, wherein said rotation stopper (94) is secured on said thrust shaft (91b) of said output cam (91) by a retainer ((95), Fig. 5, col. 9:59-60).

29. A cable disc brake (12a) according to claim 28, wherein said retainer ((95) is a c-shaped snap ring (col. 9:60-61) that is received in an annular groove ((66), Fig. 9, col. 7:12-15) of said internal bore (46) of said caliper housing (30) (as shown in Fig. 5).

30. A cable disc brake (12a) according to claim 26, wherein said actuated mechanism (34, 36) includes a return spring ((93), Fig. 5, col. 8:49-52) disposed between said rotation stopper (94) and a portion of said output cam (91) (col. 9:65 - col. 10:1).

31. A cable disc brake (12a) according to claim 16, wherein said torsion spring (99) is adjustably coupled to said caliper housing (30) and said actuating arm (98) (col. 10:46-52) to adjust the biasing force of said torsion spring (99) (col. 10:55-57).

32. A cable disc brake (12a) according to claim 22, wherein said actuated mechanism (34, 36) includes a cover ((100), Fig. 5, col. 11:30-32) disposed between said actuating arm (98) and said caliper housing (30) to seal said internal bore (46) of said caliper housing (30) (col. 11:32-35).

33. A cable disc brake (12a) according to claim 32, wherein said actuating arm (98) is biased to a release position by a biasing member ((99), Fig. 5, col. 11:12-14) arranged between said cover (100) and said caliper housing (30) (as shown in Fig. 5).

34. A cable disc brake (12a) according to claim 17, wherein said return spring (93) is a separate member from said biasing member (99) (as shown in Fig. 5).

35. A cable disc brake (12a) according to claim 34, wherein said return spring (93) is located axially on an opposite side of said input and output cams (90, 91) from said biasing member (99) (as shown in Fig. 5).

36. A cable disc brake (12a) according to claim 1, wherein said axially extending bore (91e) of said output cam (91) is a blind bore (col. 9:38-41).

(2) Reproduction of claims 37, 72, 73 and 74 of this application (plus claim 44)

37. A cable disc brake ((12a), Fig. 5, col. 6:13-16) for a bicycle comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16) with a mounting bracket ((43), Fig. 7, col. 6:41-43) structured and dimensioned to be attached to a bicycle (as shown in Fig. 2) and with a cable support ((44), Figs. 5 and 7, col. 6:41-43) having an opening ((72), Fig. 7, col. 7:37-39) for guiding a cable ((25a), Figs. 2 and 5, col. 5:55-62, col. 10:34-37) therethrough;

wherein the cable support (44) extends from a surface of the caliper housing (30) (at body portion (42) as shown in Fig. 7) and is not adjustable in any direction relative to the surface of the caliper housing (because, for example, body portion (42) and cable support (44) are one piece as clearly shown in Fig. 7 and described at col. 6:41-43);

a first friction member (left side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) for movement between a release position and a braking position (col. 6:21-24);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) and arranged substantially parallel to the first friction member (32) to form a rotor receiving slot therebetween (Fig. 5, col. 6:24-29); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to the caliper housing (30) to move the first friction member (32) in an axial direction from the release position towards the second friction member (32) to the braking position (col. 6:16-19);

wherein the actuated mechanism (34, 36) comprises an elongated actuating arm ((98), Figs. 5 and 44, col. 10:17-22) rotatably coupled to the caliper housing (30) to cause the actuated mechanism (34, 36) to move the first friction member (32) from the release position towards the braking position (col. 11:12-30);

wherein the actuating arm (98) has a curved guide surface ((98i), Fig. 44) with a first portion coincident with a cable clamp ((103, 104), Fig. 4, col. 10:34-37) and a second portion (curved tip, Fig. 4, unnumbered) that extends from the first portion towards the cable support (44) so that the cable (25a), when coupled to the cable clamp (103, 104), approaches the guide surface (98i) from the opening (72) in the cable support (44) essentially tangent to the guide surface (98i) and is supported by the guide surface (98i) when the first friction member (32) is in the release position (shown in Figs. 2 and 4).

44. A cable disc brake ((12a), Fig. 5, col. 6:13-16) according to claim 43 wherein the biasing mechanism ((99, Figs. 5 and 6, col. 10:17-20) comprising a spring ((99, Figs. 5 and 6, col. 10:17-20) having a first end ((99b), Fig. 50, col. 10:46-49) and a second end ((99c), Fig. 50, col. 10:46-49), and wherein the adjusting mechanism ((56, 102) Figs. 7 and 48, col. 10:55-57) adjusts the biasing force by moving one of the first end (99b) and the second end (99c) relative to the other one of the first end (99b) and the second end (99c) (col. 10:57-59).

Claim 44 was reproduced because claim 44 and dependent claims 45-46 were not rejected over the prior art.

72. A cable disc brake ((12a), Fig. 5, col. 6:13-16) for a bicycle comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16) with a mounting bracket ((43), Fig. 7, col. 6:41-43) structured and dimensioned to be attached to a bicycle (as shown in Fig. 2) and with a cable support ((44), Figs. 5 and 7, col. 6:41-43) having an opening ((72), Fig. 7, col. 7:37-39) for guiding a cable ((25a), Figs. 2 and 5, col. 5:55-62, col. 10:34-37) therethrough;

wherein the cable support (44) extends from a surface of the caliper housing (30) (at body portion (42) as shown in Fig. 7) and is not adjustable at any time relative to the surface of the caliper housing (because, for example, body portion (42) and cable support (44) are one piece as clearly shown in Fig. 7 and described at col. 6:41-43);

a first friction member (left side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) for movement between a release position and a braking position (col. 6:21-24);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) and arranged substantially parallel to the first friction member (32) to form a rotor receiving slot therebetween (Fig. 5, col. 6:24-29); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to the caliper housing (30) to move the first friction member (32) in an axial direction from the release position towards the second friction member (32) to the braking position (col. 6:16-19);

wherein the actuated mechanism (34, 36) comprises an elongated actuating arm ((98), Figs. 5 and 44, col. 10:17-22) rotatably coupled to the caliper housing (30) to cause the actuated mechanism (34, 36) to move the first friction member (32) from the release position towards the braking position (col. 11:12-30);

wherein the actuating arm (98) has a curved guide surface ((98i), Fig. 44) with a first portion coincident with a cable clamp ((103, 104), Fig. 4, col. 10:34-37) and a second portion (curved tip, Fig. 4, unnumbered) that extends from the first portion towards the cable support (44) so that the cable (25a), when coupled to the cable clamp (103, 104), approaches the guide surface (98i) from the opening (72) in the cable support (44) essentially tangent to the guide surface (98i) and is supported by the guide surface (98i) when the first friction member (32) is in the release position (shown in Figs. 2 and 4, col. 10:42-45).

73. A cable disc brake ((12a), Fig. 5, col. 6:13-16) for a bicycle comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16) with a mounting bracket ((43), Fig. 7, col. 6:41-43) structured and dimensioned to be attached to a bicycle (as shown in Fig. 2) and with a cable support ((44), Figs. 5 and 7, col. 6:41-43) having an opening ((72), Fig. 7, col. 7:37-39) for guiding a cable ((25a), Figs. 2 and 5, col. 5:55-62, col. 10:34-37) therethrough;

wherein the cable support (44) extends from a surface of the caliper housing (30) (at body portion (42) as shown in Fig. 7) and is not removable relative to the surface of the caliper housing (because, for example, body portion (42) and cable support (44) are one piece as clearly shown in Fig. 7 and described at col. 6:41-43);

a first friction member (left side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) for movement between a release position and a braking position (col. 6:21-24);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) and arranged substantially parallel to the first friction member (32) to form a rotor receiving slot therebetween (Fig. 5, col. 6:24-29); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to the caliper housing (30) to move the first friction member (32) in an axial direction from the release position towards the second friction member (32) to the braking position (col. 6:16-19);

wherein the actuated mechanism (34, 36) comprises an elongated actuating arm ((98), Figs. 5 and 44, col. 10:17-22) rotatably coupled to the caliper housing (30) to cause the actuated mechanism (34, 36) to move the first friction member (32) from the release position towards the braking position (col. 11:12-30);

wherein the actuating arm (98) has a curved guide surface ((98i), Fig. 44) with a first portion coincident with a cable clamp ((103, 104), Fig. 4, col. 10:34-37) and a second portion (curved tip, Fig. 4, unnumbered) that extends from the first portion towards the cable support (44) so that the cable (25a), when coupled to the cable clamp (103, 104), approaches the guide surface (98i) from the opening (72) in the cable support (44) essentially tangent to the guide surface (98i) and is supported by the guide surface (98i) when the first friction member (32) is in the release position (shown in Figs. 2 and 4, col. 10:42-45).

74. A cable disc brake ((12a), Fig. 5, col. 6:13-16) for a bicycle comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16) with a mounting bracket ((43), Fig. 7, col. 6:41-43) structured and dimensioned to be attached to a bicycle (as shown in Fig. 2) and with a cable support ((44), Figs. 5 and 7, col. 6:41-43) having an opening ((72), Fig. 7, col. 7:37-39) for guiding a cable ((25a), Figs. 2 and 5, col. 5:55-62, col. 10:34-37) therethrough;

wherein the cable support (44) extends from a surface of the caliper housing (30) (at body portion (42) as shown in Fig. 7) and is not adjustable relative to the surface of the caliper housing (because body portion (42) and cable support (44) are one piece as clearly shown in Fig. 7 and described at col. 6:41-43);

wherein the cable support (44) is one piece with the surface of the caliper housing (30) from which it extends (clearly shown in Fig. 7);

a first friction member (left side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) for movement between a release position and a braking position (col. 6:21-24);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to the caliper housing (30) and arranged substantially parallel to the first friction member (32) to form a rotor receiving slot therebetween (Fig. 5, col. 6:24-29); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to the caliper housing (30) to move the first friction member (32) in an axial direction from the release position towards the second friction member (32) to the braking position (col. 6:16-19);

wherein the actuated mechanism (34, 36) comprises an elongated actuating arm ((98), Figs. 5 and 44, col. 10:17-22) rotatably coupled to the caliper housing (30) to cause the actuated mechanism (34, 36) to move the first friction member (32) from the release position towards the braking position (col. 11:12-30);

wherein the actuating arm (98) has a curved guide surface ((98i), Fig. 44) with a first portion coincident with a cable clamp ((103, 104), Fig. 4, col.10:34-37) and a second portion (curved tip, Fig. 4, unnumbered) that extends from the first portion towards the cable support (44) so that the cable (25a), when coupled to the cable clamp (103, 104), approaches the guide surface (98i) from the opening (72) in the cable support (44) essentially tangent to the guide surface (98i) and is supported

by the guide surface (98i) when the first friction member (32) is in the release position (shown in Figs. 2 and 4, col. 10:42-45).

(3) Reproduction of claim 1 of original application no. 09/531,570

1. A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) from said release position towards said second friction member (32) to said braking position (col. 6:16-19), said actuated mechanism (34, 36) having first and second cam members ((90, 91), Fig. 5, col. 8:49-52) movably arranged between an axially retracted position and an axially extended position (col. 8:53-61) with a guide member ((90c), Fig. 5, col. 8:62-65) interconnecting said first and second cam members (90, 91) (col. 9:39-42) during movement between said axially retracted position and said axially extended position (col. 9:42-45).

(4) Reproduction of claim 1 of original application no. 09/531,570 as amended

1. (Amended, marked-up) A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) in an axial direction from said release position towards said second friction member (32) to said braking position (col. 6:16-19) without rotating said first friction member (32) (since output cam (91), which moves first friction member (32) axially, is nonrotatably mounted to rotation stopper (94), col. 9:49-53), said actuated mechanism (34, 36) having first and second cam members ((90, 91), Fig. 5, col. 8:49-52) movably arranged between an axially retracted position and an axially extended position (col. 8:53-61) with a guide member ((90c), Fig. 5, col. 8:62-65) interconnecting said first and second cam members (90, 91) (col. 9:39-42) during movement between said axially retracted position and said axially extended position (col. 9:42-45),

one (90) of said first and second cam members (90, 91) being rotatably mounted within said caliper housing (30) (Fig. 5, col. 8:56-61), and the other (91) of said first and second cam members (90, 91) being movably mounted in said axial direction (col. 9:32-37).

1. (Amended, clean) A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) in an axial direction from said release position towards said second friction member (32) to said braking position (col. 6:16-19) without rotating said first friction member (32) (since output cam (91), which moves first friction member (32) axially, is nonrotatably mounted to rotation stopper (94), col. 9:49-53), said actuated mechanism (34, 36) having first and second cam members ((90, 91), Fig. 5, col. 8:49-52) movably arranged between an axially retracted position and an axially extended position (col. 8:53-61) with a guide member ((90c), Fig. 5, col. 8:62-65) interconnecting said first and second cam members (90, 91) (col. 9:39-

42) during movement between said axially retracted position and said axially extended position (col. 9:42-45),

one (90) of said first and second cam members (90, 91) being rotatably mounted within said caliper housing (30) (Fig. 5, col. 8:56-61), and the other (91) of said first and second cam members (90, 91) being movably mounted in said axial direction (col. 9:32-37).

(5) Reproduction of claim 1 of original application no. 09/531,570 as twice amended

1. (Twice Amended, marked-up) A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) in an axial direction from said release position towards said second friction member (32) to said braking position (col. 6:16-19) ~~without rotating said first friction member (32)~~, said actuated mechanism (34, 36) ~~having first and second cam members ((90, 91), Fig. 5, col. 8:49-52) movably arranged between an axially retracted position and an axially extended position (col. 8:53-61) with a guide member (90c) interconnecting said first and second cam members (90, 91) during movement between said axially retracted position and said axially extended position;~~

~~one (90) of said first and second cam members (90, 91) being rotatably mounted within said caliper housing (30), and the other (91) of said first and second cam members (90, 91) being movably mounted in said axial direction~~ including

an input cam ((90), Fig. 5, col. 8:49-52) movably mounted within said caliper housing (30) to move in a rotational direction about a longitudinal axis (col. 8:56-61), but not in an axial direction (because input cam (90) is one-piece and is axially immovably fastened to caliper housing (30) via nut (97) as shown in Fig. 5), said input cam having a first camming surface ((90d), Fig. 31, col. 8:65-67) with an axially extending guide member ((90c), Fig. 5,

col. 8:62-65) non-movably fixed thereto at said longitudinal axis (because input cam (90), including guide member (90c), is one-piece as shown in Fig. 5), and

an output cam ((91), Fig. 5, col. 8:49-52) movably mounted within said caliper housing (30) to move in the axial direction in response to rotation of said input cam (30) (col. 9:33-38), but not in the rotational direction (col. 9:45-49), said output cam having a second camming surface ((91c), Fig. 35, col. 9:31-33) with an axially extending bore ((91e), Fig. 34, col. 9:39-42), said guide member (90c) being at least partially disposed within said bore (91e) (Fig. 5, col. 9:39-42) to ensure smooth relative movement between said input and output cams (90, 91) (col. 9:24-27).

1. (Twice Amended, clean) A cable disc brake ((12a), Fig. 5, col. 6:13-16) comprising:

a caliper housing ((30), Fig. 5, col. 6:13-16);

a first friction member (left side (32), Fig. 6, col. 6:13-16) movably coupled to said caliper housing (30) between a release position and a braking position (col. 6:24-29);

a second friction member (right side (32), Fig. 6, col. 6:13-16) coupled to said caliper housing (30) and arranged substantially parallel to said first friction member (32) to form a rotor receiving slot therebetween (shown but unlabeled in Fig. 5, col. 7:62-65); and

an actuated mechanism ((34, 36), Fig. 5, col. 6:16-19) movably coupled to said caliper housing (30) to move said first friction member (32) in an axial direction from said release position towards said second friction member (32) to said braking position (col. 6:16-19), said actuated mechanism (34, 36) including

an input cam ((90), Fig. 5, col. 8:49-52) movably mounted within said caliper housing (30) to move in a rotational direction about a longitudinal axis (col. 8:56-61), but not in an axial direction (because input cam (90) is one-piece and is axially immovably fastened to caliper housing (30) via nut (97) as shown in Fig. 5), said input cam having a first camming surface ((90d), Fig. 31, col. 8:65-67) with an axially extending guide member ((90c), Fig. 5, col. 8:62-65) non-movably fixed thereto at said longitudinal axis (because input cam (90), including guide member (90c), is one-piece as shown in Fig. 5), and

an output cam ((91), Fig. 5, col. 8:49-52) movably mounted within said caliper housing (30) to move in the axial direction in response to rotation of said input cam (30) (col.

9:33-38), but not in the rotational direction (col. 9:45-49), said output cam having a second camming surface ((91c), Fig. 35, col. 9:31-33) with an axially extending bore ((91e), Fig. 34, col. 9:39-42), said guide member (90c) being at least partially disposed within said bore (91e) (Fig. 5, col. 9:39-42) to ensure smooth relative movement between said input and output cams (90, 91) (col. 9:24-27).

POINT (2)

(1) Why relevant limitations of claims 37, 44 and 72-74 should be considered to have been "overlooked."

The limitations in claim 37 believed to be overlooked include the text "wherein the cable support extends from a surface of the caliper housing and is not removable relative to the surface of the caliper housing ... wherein the actuating arm has a curved guide surface with a first portion coincident with a cable clamp and a second portion that extends from the first portion towards the cable support so that the cable, when coupled to the cable clamp, approaches the guide surface from the opening in the cable support essentially tangent to the guide surface and is supported by the guide surface when the first friction member is in the release position." These aspects are believed to have been overlooked because they were not previously claimed during prosecution of the application maturing into the patent sought to be reissued and because the distinct invention represented by this claim was not the focus of prosecution.

The limitations in claim 72 believed to be overlooked include the text "wherein the cable support extends from a surface of the caliper housing and is not adjustable at any time relative to the surface of the caliper housing ... wherein the actuating arm has a curved guide surface with a first portion coincident with a cable clamp and a second portion that extends from the first portion towards the cable support so that the cable, when coupled to the cable clamp, approaches the guide surface from the opening in the cable support essentially tangent to the guide surface and is supported by the guide surface when the first friction member is in the release position." These aspects are believed to have been overlooked because they were not previously claimed during prosecution of the application maturing into the patent sought to be reissued and because the distinct invention represented by this claim was not the focus of prosecution.

The limitations in claim 73 believed to be overlooked include the text "wherein the cable support extends from a surface of the caliper housing and is not removable relative to the surface of the caliper housing ... wherein the actuating arm has a curved guide surface with a first portion coincident with a cable clamp and a second portion that extends from the first portion towards the cable support so that the cable, when coupled to the cable clamp, approaches the guide surface from the opening in the cable support essentially tangent to the guide surface and is supported by the guide surface when the first friction member is in the release position." These aspects are believed to have been overlooked because they were not previously claimed during prosecution of the application maturing into the patent sought to be reissued and because the distinct invention represented by this claim was not the focus of prosecution.

The limitations in claim 74 believed to be overlooked include the text "wherein the cable support extends from a surface of the caliper housing and is not adjustable relative to the surface of the caliper housing; wherein the cable support is one piece with the surface of the caliper housing from which it extends ... wherein the actuating arm has a curved guide surface with a first portion coincident with a cable clamp and a second portion that extends from the first portion towards the cable support so that the cable, when coupled to the cable clamp, approaches the guide surface from the opening in the cable support essentially tangent to the guide surface and is supported by the guide surface when the first friction member is in the release position." These aspects are believed to have been overlooked because they were not previously claimed during prosecution of the application maturing into the patent sought to be reissued and because the distinct invention represented by this claim was not the focus of prosecution.

Pursuant to Point(1)(2), Shimano reproduced claim 44. The limitations in claim 44 believed to be overlooked include the text "wherein the biasing mechanism comprising a spring having a first end and a second end, and wherein the adjusting mechanism adjusts the biasing force by moving one of the first end and the second end relative to the other one of the first end and the second end." These aspects are believed to have been overlooked because they were not previously claimed in conjunction with the limitations of claim 37 during prosecution of the application maturing into the patent sought to be reissued.

(2) Why relevant limitations of claims 37, 44 and 72-74 are "material."

This point will be discussed in much greater detail below. Briefly, in this case, the overlooked aspects are considered material in that, when combined with the omission of the cam members, they cause claims 37 and 72-74 to be directed to "distinct subject matter, disclosed, but not claimed, in the original application and patent." *In re Murray*, 64 F.2d 788, 791 (C.C.P.A. 1933). The *Murray* case was discussed in more detail at page 10 of Appellant's brief. In accord is *B.E. Meyers & CO. v. U.S.* 47 Fed.Cl. 200, 56 USPQ.2d 1110 (Fed.Cl. 2000), also discussed at page 10 of Appellant's brief.

As noted above, Shimano reproduced claim 44 because claim 44 and dependent claims 45-46 were not rejected over the prior art. Insofar as *Ex Parte Bradshaw*, cited in the Interlocutory Order, supports the proposition that a limitation is material when a reissue claim that contains that limitation is patentable over the prior art, then the limitations recited in claim 44 are material, and claims 44-46 escape the recapture rule.

Point 3

What criteria should be used to determine whether a limitation is "material."

It is well-known that the precedent directed to the recapture doctrine is very difficult to navigate, and very little guidance exists for what constitutes a "material" narrowing of a reissue claim. While some cases indicate that a reissue claim containing a limitation that is patentable over the prior art may escape recapture (e.g., *Ex Parte Bradshaw*, cited in the Interlocutory Order, *Murray*, *supra*, and *Meyers*, *supra*), other cases appear to indicate that features that were deemed to impart patentability during prosecution of the reissue application do not save the claim from recapture (e.g., *Mentor Corp. v. Colorplast*, 998 F.2d 992 (Fed. Cir. 1993), *In re Clement*, 131 F.3d 1464 (Fed. Cir. 1997), and *Pannu v. Storz Instrument, Inc.*, 258 F.3d 1366, (Fed. Cir. 2001). Shimano fully agrees with Judge McKelvey's concurring opinion in *Ex parte Browning, et al*, Appeal 2007-0700 (Bd. Pat. App. & Int. June 20, 2007) in that the risks to the patentee in this area are great, and Shimano is prepared to seek guidance from the Court of Appeals for the Federal Circuit (as suggested by Judge McKelvey in that case), if necessary. In view of that possibility,

Shimano will set forth a methodology that it believes may be helpful to resolve some of the issues involved.

It is submitted that any criteria used for determining whether a reissue claim is barred by the recapture rule should be consistent with the equitable nature of reissue proceedings. While it is highly desirable to prevent a patentee from unfairly "pulling a fast one" on the PTO and the public, it is also highly desirable to allow the correction of a good faith mistake so that an inventor can receive the full benefits of his or her inventive activity.

Pages 12-13 of the Interlocutory Order set forth the expanded test for recapture stated in *Clement*, *supra*, supplemented by the additional principle stated in *Hester Industries v. Stein, Inc.*, 142 F.3d 1472 (Fed. Cir. 1998). This expanded test will be referred to as the *Clement/Hester* test for convenience. Insofar as the principles set forth in the *Clement/Hester* test govern this appeal, rather than the abbreviated test set forth in recent cases such as *Medtronic Inc. v. Guidant Corp.*, 465 F.3d 1360, 1373 (Fed. Cir. 2006) (cited at page 8 of Shimano's appeal brief), then those principles raise new issues that Shimano needs to address in order to show how the arguments made in Shimano's appeal brief fit the *Clement/Hester* test and are not overlooked by the Board.

It is believed that identification of the patentability issues involved in the original application and in the reissue application must be made *prior* to application of the *Clement/Hester* test because the result of the test differs depending on the issues involved. As discussed below, Shimano's appeal brief raised *two* patentability issues, and they will be applied to the *Clement/Hester* test accordingly.

As a general proposition, it is submitted that *any* amendment (whether broadening or narrowing) in a reissue claim may avoid the recapture rule when that amendment changes the patentability issue relative to the amendments and arguments made during prosecution of the original application and when it is equitable to do so. For example, the last sentence in the last paragraph at page 9 of Shimano's appeal brief states "[t]here was never a 'canceled claim' that included within its scope a cam-less brake device such that protection of a cam-less brake device was surrendered in view of the prior art." In other words, the patentability issue during prosecution of the original application was what configuration of the recited cams was necessary for

patentability, whereas the patentability issue in this case is whether or not the cams are required at all. That is a very different issue, and the issue is relevant to Principle 3(a) of the *Clement/Hester* test as discussed below. That a *broadening* amendment may avoid the recapture rule was recognized in footnote 1 accompanying the quoted text. This first argument seems to have been overlooked in the Interlocutory Order at pages 11-12.

The patentability issue also is changed is when the amendment in the reissue claim causes the reissue claim to recite a different invention compared to the canceled claim. That is Shimano's second argument made at pages 11, et seq. of Shimano's brief. If there is no canceled claim, as in *Hester*, this comparison could be made using a hypothetical claim that omits the limitations argued for patentability.

It is initially submitted that a different invention does not exist when a reissue claim simply defines the same essential characteristics of a single disclosed embodiment and merely provides a different definition of the same disclosed subject matter, varying in breadth or scope of definition. See MPEP §806.03. Inventions are different when they are not connected in at least one of design, mode of operation, function or effect. However, inventions need not be *distinct* (i.e., patentable over each other) as set forth in MPEP §802.01(II) as long as the differences have some true technological significance. For example, different inventions include genus and/or species inventions as described in MPEP §806.04, mutually exclusive inventions as described in MPEP §806.05, combination and subcombination inventions as described in MPEP §806.05(a), and so on. Insofar as limitations *added* to a reissue claim cause the reissue claim to be directed to a different invention compared to the canceled/hypothetical claim, then the added limitations are material because of that fact.

As applied to the facts of this case, canceled claim 1 of the original application included first and second cam members but did not recite an actuating arm. Independent reissue claims 37 and 72-74 omit the first and second cam members but recite a detailed configuration of an actuating arm and its relation to a cable support. The focus of the reissue claims (a unique configuration of an actuating arm) is completely different from the focus of the canceled claims (a cam-based actuated mechanism). The claimed inventions are not connected in design because the cam-based actuated mechanism can be used without the claimed actuating arm and vice versa. The claimed inventions

are not connected in operation because the recited configuration of the actuating arm does not affect how the cams operate in the canceled claim and vice versa. The claimed inventions are not connected in effect because the effect of the cams (to push the brake pads against the brake rotor) is not affected by the configuration of the actuating arm, and the effect of the claimed configuration of the actuating arm (to control the orientation of the control cable) is not affected by the cams. The inventions recited in the canceled and reissue claims are mutually exclusive because the invention recited in the canceled claim would not infringe the invention recited in the reissue claim, and the invention recited in the reissue claim would not infringe the invention recited in the canceled claim. Because the inventions as claimed have a materially different design, mode of operation, function, and effect, the canceled and reissue claims clearly recite different inventions.

Once it is determined whether or not the reissue claim recites a different invention, then Principle 1 of the *Clement/Hester* test may be applied: If the reissue claim is as broad as or broader than the canceled claim in all aspects, the recapture rule bars the claim. Clearly, that does not apply in this case because of the addition of the configuration of the actuating arm. However, it is worth considering how Shimano's proposed methodology fits within that principle.

Consider a claim directed to a tractor-trailer combination, wherein the claim conceptually contains elements AB-CD, wherein elements AB are directed to the tractor, and elements CD are directed to the trailer. Assume during prosecution that the applicant points out how element B overcomes a rejection over the prior art, and claim AB-CD is allowed. Pursuant to *Hester*, there is some surrender with respect to element B. Less than two years after the patent issues, the patentee notices that the trailer CD by itself, perhaps by virtue of element D, also could have distinguished the combination over the prior art. Element D was neither amended nor argued during the prosecution of the original patent application. If the patentee attempts to file a reissue application with new claim CD directed to the trailer alone, then Principle 1 on its face would appear to bar such a claim because claim CD is broader than claim AB-CD in all aspects. That would be an extremely inequitable result.

Clement cited *Ball Corporation. v. United States*, 729 F.2d 1429 (Fed. Cir. 1984) and *In re Byers*, 230 F.2d 451 (CCPA 1956) in support of Principle 1. While *Ball* cited Principle 1, *Clement*

itself noted that the claims in *Ball* were not broader than the canceled claim in all aspects, so *Ball's* statement of Principle 1 was dictum as applied to that case. As for *Byers*, the court stated:

> "A comparison of the claims makes it clear that appealed claims 2 and 3 are drawn to the *same invention* as was original claim 20 of appellant's original application, and that they are broader in certain respects and not narrower in any respect to that claim." (*emphasis added*) *Id.* at 455

Thus, *Byers* was directed to a reissue claim that was directed to the same invention as the canceled claim. It is submitted that Principle 1 should apply only when the reissue claim is directed to the *same invention* as the canceled/hypothetical claim. Since claim CD recites an invention that is different from claim AB-CD, it is submitted that Principle 1 does not bar claim CD.

The foregoing example illustrates the importance of determining whether the inventions recited in the canceled/hypothetical claim and the reissue claim are directed to different inventions *prior* to applying the recapture principles.

Principle 2 states: If the reissue claim is narrower than the canceled or amended claim in all aspects, the recapture rule does not apply, but other rejections are possible. This principle does not apply to the reissue claims under appeal because the reissue claims delete the cams recited in the canceled claim. Thus, the reissue claims are broader than the canceled claim in those aspects.

Principle 3 states: If the reissue claim is broader in some aspects, but narrower in other aspects, than the canceled or amended claim, then:

> Principle 3(a): if the reissue claim is as broad as or broader in an aspect germane to a prior art rejection of a claim in the original application, but narrower in another aspect completely unrelated to the rejection, the recapture rule bars the reissue claim, or
>
> Principle 3(b): if the reissue claim is narrower in an aspect germane to the prior art rejection, and broader in an aspect unrelated to the rejection, the recapture rule does not bar the claim, but other rejections are possible.

Before applying Principle 3, it must be determined what is "an aspect germane to a prior art rejection." The American Heritage Dictionary of the English Language (available at http://www.bartleby.com/61/) defines "germane" as "being both pertinent and fitting." Thus, not only must the aspect be "pertinent," it also must be "fitting." The definition of "fitting" is "being in keeping with a situation; appropriate." Thus, an aspect germane to a prior art rejection is an aspect that is pertinent and is keeping with the situation of the prior art rejection. To be "keeping with the situation," the following two questions should be asked: What were the applicant and the examiner arguing about during prosecution of the original application? What were the applicant and the examiner arguing about during prosecution of the reissue application?

As applied to Shimano's first patentability issue, the issue during prosecution of the original application was what configuration of the recited cams was necessary for patentability, whereas the issue in this case is whether or not the cams are required at all. The patentability issue raised during prosecution of the reissue application is not keeping with the situation of the patentability issue addressed during prosecution of the original application. It is a very different issue. The prior art rejection was never applied to the cam-less brake recited in the reissue claim, so the broadening aspect of the reissue claim is not *germane* to that prior art rejection.

Similarly, as applied to Shimano's second patentability issue, the issue during prosecution of the original application was whether or not a cam-based brake was patentable over the prior art, whereas the issue in this case is whether or not a different invention directed to a brake with a unique configuration of an actuating arm is patentable over the prior art. Because of the different inventions involved, the situations in the two cases are completely different. The prior art rejection was never applied to the different invention recited in the reissue claim, so the broadening aspect of the reissue claim is not germane to that prior art rejection.

Furthermore, insofar as the recapture doctrine is intended to force an applicant to appeal a prior art rejection rather than attempt to recapture surrendered subject matter in a later reissue application, this goal is never achieved when (1) a camless brake or (2) a different invention that may result from the elimination of the cams was not subjected to the prior art rejection. The

applicant never had the opportunity to appeal a rejection of a claim directed to either of those two situations.

Thus, once it is determined that a broadening aspect is not "germane to a prior art rejection of a claim in the original application," then Principle 3(a) simply does not apply, and it is not necessary to consider whether or not the reissue claim is narrower in another aspect completely unrelated to the rejection.

Similarly, since the broadening aspect in this case is not "germane to the prior art rejection" as noted above, Principle 3(b) does not apply either. In any event, the reissue claims under appeal do not contain any narrower version of the first and second cams, so Principle 3(b) does not apply to the reissue claims for that reason as well.

The approach of first determining whether the reissue claim is directed to a different invention compared to the canceled claim prior to applying the *Clement/Hester* test is consistent with the following restatement of the recapture test set forth in *Medtronic*, *supra*:

> "The first issue is whether the claims at issue, in this case claims 1, 7, 15 and 16 of the '895 application, ever disclosed the **unconditional embodiment**. *See N. Am. Container*, 415 F.3d at 1349. If they did, the second issue is whether the unconditional embodiment was surrendered during prosecution. *See id.* If it was, the final question is whether the RE'119 claims were materially narrowed in other respects so that the claims may not have been enlarged and thus avoid the recapture rule. *See id.*" (*emphasis added*)

If the reissue claims never recited the different invention, then the inquiry should stop there pursuant to the first issue addressed in *Medtronic*.

The determination of whether or not reissue claims are directed to a different invention also is related to the principle articulated by *Hester* set forth in the Interlocutory Order. Once it is determined that a narrowing amendment converts a reissue claim into a different invention, then, as noted in the above analysis, the recapture rule is avoided altogether, subject to the equitable considerations discussed below.

Because of the above methodology, Shimano does not adopt the approach taken in *Ex parte Bradshaw*, cited in the Interlocutory Order, although Shimano believes the result was correct pursuant to Shimano's proposed methodology. *Bradshaw* involved claims directed to a label-making machine. The label-making machine includes an upper frame and a lower frame. An upper feed roll and an upper roller are rotatably supported by the upper frame, and a lower feed roll and a lower roller are rotatably supported by the lower frame. The lower frame also includes a feed tray for supporting the unprocessed printed label paper (referred to as a "master"). The lower feed roll contains a sheet material that includes a transferrable adhesive on one side. The upper feed roll contains a sheet material that can take up any adhesive not transferred to the label paper.

During operation, the upper roller is located adjacent to the lower roller, the label paper is sandwiched between the sheet material from the upper feed roll and the sheet material from the lower feed roll, and the three sheets are passed between the upper and lower rollers. As the upper roller is rotated by a hand crank to simultaneously pull the three sheets through the upper and lower rollers, the adhesive from the lower sheet is transferred to the underside of the label paper, and any adhesive not transferred to the label paper is transferred to the upper sheet.

To facilitate setup, the back side of the upper frame is pivotably connected to the back side of the lower frame so that the upper frame can be pivoted upwardly and backward away from the lower frame, thereby separating all of the components supported by the upper frame from the components supported by the lower frame. To ensure proper feeding of the sheets from the upper and lower feed rolls, a pre-tensioning device is mounted to the side of each feed roll.

The original claims recited the pre-tensioning means for the rollers. The reissue claims under appeal were directed to the pivoting nature of the upper frame relative to the lower frame and did not include the pre-tensioning means. The Board held that the reissue claims were not precluded by the recapture rule. It is believed that the result therein is consistent with Shimano's proposed methodology because the reissue claims in *Bradshaw* clearly were directed to a different invention compared to the canceled claims.

However, pursuant to Point(1)(2) of the Interlocutory Order, Shimano reproduced claim 44 because claim 44 and dependent claims 45-46 were not rejected over the prior art. Insofar as *Bradshaw* supports the proposition that a limitation is material when a reissue claim that contains that limitation is patentable over the prior art, then the limitations recited in claim 44 are considered to be material, and claims 44-46 escape the recapture rule under that rationale.

Thus, Shimano believes that the proposed methodology sets forth workable criteria for determining whether or not a reissue claim is barred by the recapture rule, and particularly how to determine whether an added limitation is "material." An added limitation is material when the limitation causes a reissue claim to recite a different invention or otherwise causes the reissue claim to recite features that have true technical significance, such as a change in design, mode of operation, function, or effect. If a different invention is *distinct* as defined in MPEP §802.01(II), then that fact clearly should establish the materiality of the added limitations.

To address the last request in Point (3) at page 16 of the Interlocutory Order, it is believed not necessary for the reissue claim to define subject matter patentable over the prior art, since actual patentability over the prior art is not at issue when determining whether a claim recites a different invention.

Shimano recognizes that some cases appear to hold that a limitation that already exists in the prior art (e.g., *Mentor*, *supra*) or is recited in one of the original patent claims (E.g., *Hester*, *supra*) cannot be considered to be "overlooked" or material. Those cases did not analyze whether the limitations at issue produced a claim directed to a different invention or whether the broadening aspects were otherwise not germane to the previous prior art rejection. Accordingly, those cases should not bar a reissue claim in a future case where that the patentee actually argues that the reissue claim recites a different invention or that the broadening aspects otherwise were not germane to the previous prior art rejection and the failure to previously present the subject matter in the reissue claim was a good-faith error.

Shimano also believes that the proposed methodology is consistent with many well-known recapture cases. As noted in Shimano's Appeal Brief, both *Murray* and *Meyers* involved reissue claims directed to different inventions that were held to be patentable.

In re Richman, 409 F.2d 269 (CCPA 1969) presented the case where the reissue claims were intermediate in scope in the area that was narrowed during prosecution. In that case, the reissue claims were directed to a circuit for controlling a color television that could receive either monochrome (black-and-white) or color signals. With respect to reissue claim 25, one of the canceled claims (claim 8) recited "a unidirectional control signal representative of the phase relation of ... [the] generated signal and ... [the] synchronizing signal," whereas reissue claim 25 required the control signal in question to have one value when the reference generator output is in synchronism with a synchronizing signal at the desired phase relation and another value *both* when the synchronizing signal is absent and when it is present but out of synchronism with the reference generator oscillations. This feature permitted a "fail safe" operation that enabled a color signal translating circuit only when the receiver could operate properly to reproduce a color program. Using Shimano's proposed methodology, reissue claim 25 recited a different invention, so the recapture rule did not apply.

Canceled claim 8 and another canceled claim 14 were relevant to reissue claim 23 as well. The relevant limitations in canceled claims 8 and 14 were paraphrased as "a unidirectional control signal representative of the phase relation of said other generated [or developed] signal and said synchronizing signal." Another canceled claim (claim 7) recited "a unidirectional control signal of maximum magnitude when said first signal [reference generator signal] and said synchronizing signal are in phase." Thus, the canceled claims defined the control signal in terms of the phase relationship between the generated reference signal and the synchronizing signal without any reference to the absence of the latter signal, whereas reissue claim 23 defined the control signal in terms of conditions at synchronism on the one hand and absence of a synchronizing signal on the other. Using Shimano's proposed methodology, reissue claim 23 recited a different invention, so the recapture rule did not apply.

In *Mentor*, the invention was directed to a male condom catheter wherein the canceled claim was amended and argued to require an adhesive located on a release layer on an outer surface of a rolled-up sheath member such that, as the sheath member is unrolled, the adhesive on the outer surface of the sheath member is transferred to the inner surface of the sheath member. The reissue claim omitted the requirement of the adhesive transfer and replaced that limitation with the broader requirement that the adhesive simply release from the release layer of the outer surface of a cylindrical member due to unrolling of the cylindrical member and adhere only to the inner surface of the cylindrical member. The reissue claim added some narrowing limitations relative to the canceled claim, such as the cylindrical member being flexible rather than resilient, that the cylindrical member form a single roll, that the release layer be located "thereon" the outer surface of the cylindrical member, and that the adhesive adhere only to the inner surface. The court held the reissue claims barred by the recapture rule.

Clearly, the reissue claim in *Mentor* simply defined the same essential characteristics of a single disclosed embodiment and merely provided a different definition of the same disclosed subject matter, varying only in breadth or scope of definition. Thus, the reissue claim did not recite a different invention compared to the canceled claim, and the new limitations did not seem to have any technical significance. As noted by the court, the "flexible" limitation was merely a restatement of the "resilient" limitation in the canceled claim, and the "single roll" limitation was inherent. The requirement that the release layer be located "thereon" the outer surface of the cylindrical member likewise could be a simple restatement or a trivial modification of the canceled claim requirement that the release layer be located between the adhesive and the outer surface of the sheath member. That the adhesive adhere "only" to the inner surface of the cylindrical member appears to be a trivial difference.

Additional limitations appeared in dependent claims. One claim required the adhesive release layer and the adhesive to extend over at least one turn of the roll, and another dependent claim recited the adhesive release layer being formed of silicon rubber. It is not surprising that the court deemed these two features to be immaterial. Finally, another dependent claim recited a bulbous surge chamber secured to the outlet side of the cylindrical member. The court noted that this feature was already disclosed in the prior art. The court did not analyze whether this combination could

result in a different invention. It may be that the addition of such a surge chamber was plainly obvious so that it would be inequitable to the public to allow the claim to escape the recapture rule.

In *Clement*, the invention was directed to a method of treating a mixture of printed and contaminated waste paper in order to produce pulps for use in the manufacture of paper and paperboards. The reissue claim differed from the canceled claim only in the recitation of the brightness of a resulting fibrous suspension. The court held the reissue claims barred by the recapture rule.

Clearly, the reissue claim in *Clement* was not directed to a different invention, and it is difficult to believe that the brightness limitation could be deemed patentable on its face. It appears that the reissue claim merely provided a different definition of the same disclosed subject matter, varying only in breadth or scope of definition of the brightness of the fibrous suspension relative to the canceled claim (although the reissue claim as a whole was deemed by the examiner to be patentable over the prior art). There were additional limitations recited in some dependent claims, but the court did not analyze them in any detail.

In *Hester*, the invention was directed to a food cooker. During prosecution, the applicant distinguished over the prior art by emphasizing how the claims required cooking "only with steam," supplied by "two sources of steam." The reissue claims deleted these requirements but added "spiral conveyance path" and "high humidity steam" limitations. The court held the reissue claims barred by the recapture rule. The court noted that the "high humidity steam" limitation was the same or broader in scope than similar features recited in the original claims, and that the "spiral conveyance path" was inherent from the recitation of a "means passing said conveyor belt though said housing" in the original claims. Thus, clearly there was no material narrowing involved. Also, since both limitations were implicitly included in original claim 1, neither limitation could have been "overlooked." The court also noted that a spiral conveyance path was recited in claim 12, and therefore that limitation could not have been overlooked for that reason as well. However, that latter observation appears to be dictum.

In *Pannu*, the invention was directed to an intraocular lens. The lens comprises an "optic" lens that focuses light on the retina, at least two flexible elements that attach to the optic lens, and snag resistant elements attached to the end of each flexible element. During prosecution, the canceled claim was amended to clarify that the flexible elements defined "a continuous, substantially circular arc having a diameter greater than the diameter of said lens body, said arc curved toward said lens circumference." This limitation was deleted in a reissue claim, but the reissue claim added the requirement that the snag resistant elements are at least three times greater in width than the width of said flexible elements, wherein the snag resistant elements and the flexible elements are coplanar. That was the only narrowing limitation. The court held the reissue claims barred by the recapture rule.

Clearly, the reissue claim in *Pannu* did not recite a different invention compared to the canceled claim, for the reissue claim merely clarified the size and orientation of the snag resistant elements. Indeed, such a size and orientation does not even seem to materially narrow the snag resistant elements.

In *North American Container v. Plastipak Packaging Inc.* 415 F.3d 1335 (Fed. Cir. 2005), the invention was directed to the configuration of a plastic container. The container included a side wall and a base portion, wherein the base portion included a central re-entrant portion. The re-entrant portion is a concave portion that rises from the lowermost outer bottom edges of the base portion towards the center. The canceled claim was amended to clarify that the inner wall portions of the re-entrant portion are "generally convex." The reissue claim deleted this limitation and substituted "wherein the diameter of said re-entrant portion is in the range of 5% to 30% of the overall diameter of said side wall." The court held the reissue claims barred by the recapture rule. Clearly, the reissue claim in *North American Container* did not recite a different invention compared to the canceled claim, and the reissue claim merely clarified the size of the re-entrant portion.

In summary, it is believed that an added limitation that causes a reissue claim to recite a different invention compared to a canceled/hypothetical claim is material because of that transformation. However, it is believed that *any* amendment, whether broader or narrower, that causes a reissue claim to recite a different invention relative to a canceled/hypothetical claim can

remove the reissue claim from the recapture rule as long as the broadened aspects of the claim present a different situation relative to the previous prior art rejection (i.e., the broadened aspects are not germane to the prior art rejection). The proposed methodology is only one methodology, and there may be others. For example, the methodology could be extended to any added limitation that produces a reissue claim that is in fact patentable relative to the canceled/hypothetical claim, whether or not the reissue claim recites a different invention. However, the added limitation should have some true technological significance.

Furthermore, the methodology could be modified whenever the result would be inequitable to the public. For example, a method claim often is considered to recite a different invention compared to an apparatus claim. However, if a reissue method claim is nothing more than the recitation of a canceled apparatus claim in method form, then equity clearly dictates that the methodology should not apply. The methodology also should not apply if a reissue claim merely adds another component to a canceled claim under the guise of creating a combination claim when the added component is the most likely component that would be used with the apparatus recited in the canceled claim. Such a prohibition may be consistent with the reasoning of the court in *Mentor*.

Point (4)

The prosecution history set forth in the Interlocutory Order is correct except for the following matters:

Page 8, line 22, "level" should be --lever--.

Page 8, line 23, "treated" should be --threaded--.

Page 9, line 3, "treaded" should be --threaded--.

Page 10, line 5, "said" should be --~~said~~ **the**--.

Page 10, line 16, "~~as~~" should be --~~at~~--.

Point (5)

Application of the limitations of the canceled claim and reissue claim to Shimano's arguments.

Clearly, the argument presented by Shimano was in conceptual form. However, all that is necessary to apply the argument to the facts of this case is to increase the number of letters used to represent the claims. In the following claim charts, numerical subscripts are used to denote sub-limitations of a claimed feature, rather than the primed letters (e.g., C') mentioned in Shimano's appeal brief.

Canceled Claim 1	Patent Claim 1
1. A cable disc brake comprising:	1. A cable disc brake comprising:
A: a caliper housing;	**A:** a caliper housing;
B: a first friction member **B_1:** coupled to said caliper housing **B_2:** moves between a release position and a braking position;	**B:** a first friction member **B_1:** coupled to said caliper housing **B_2:** moves between a release position and a braking position;
C: a second friction member **C_1:** coupled to said caliper housing **C_2:** arranged substantially parallel to said first friction member **C_3:** to form a rotor receiving slot therebetween	**C:** a second friction member **C_1:** coupled to said caliper housing **C_2:** arranged substantially parallel to said first friction member **C_3:** to form a rotor receiving slot therebetween
D: an actuated mechanism **D_1:** movably coupled to said caliper housing **D_2:** to move said first friction member	**D:** an actuated mechanism **D_1:** movably coupled to said caliper housing **D_2:** to move said first friction member

D_{21}: in an axial direction **D_{22}:** from said release position towards said second friction member to said braking position **D_3:** first and second cam members **D_{31}:** move between an axially retracted position and an axially extended position **D_{32}:** one of said first and second cam members being rotatably mounted within said caliper housing **D_{33}:** the other of said first and second cam members being movably mounted in said axial direction **D_4:** a guide member **D_{41}:** interconnecting said first and second cam members **D_{411}:** during movement of the first and second cam members between said axially retracted position and said axially extended position	**D_{21}:** in an axial direction **D_{22}:** from said release position towards said second friction member to said braking position **D_5:** first cam **D_{51}:** input **D_{52}:** movably mounted **D_{53}:** within said caliper housing **D_{54}:** to move in a rotational direction **D_{541}:** about a longitudinal axis **D_{542}:** but not in an axial direction **D_{55}:** a first camming surface **D_{56}:** an axially extending guide member fixed to the camming surface **D_{561}:** immovably fixed **D_{562}:** at said longitudinal axis **D_{563}:** at least partially disposed within the bore of the output cam **D_{5531}:** to ensure smooth relative movement between said input and output cams.

	D_6: second cam **D_{61}:** output **D_{62}:** movably mounted **D_{63}:** within said caliper housing **D_{64}:** to move in the axial direction **D_{641}:** in response to rotation of said input cam **D_{642}:** but not in the rotational direction **D_{65}:** a second camming surface **D_{66}:** an axially extending bore

Reissue Claim 37
A cable disc brake for a bicycle comprising:
A: a caliper housing **A_1:** a mounting bracket **A_{11}:** structured and dimensioned to be attached to a bicycle **A_2:** a cable support **A_{21}:** having an opening for guiding a cable therethrough; **A_{22}:** extends from a surface of the caliper housing **A_{23}:** not adjustable in any direction relative to the surface of the caliper housing;

B: a first friction member

B_1: coupled to the caliper housing

B_2: moves between a release position and a braking position;

C: a second friction member

C_1: coupled to the caliper housing

C_2: arranged substantially parallel to the first friction member

C_3: to form a rotor receiving slot therebetween

D: an actuated mechanism

D_1: movably coupled to the caliper housing

D_2: to move the first friction member

D_{21}: in an axial direction

D_{22}: from the release position towards the second friction member to the braking position

D_8: an actuating arm

D_{81}: elongated

D_{82}: rotatably coupled to the caliper housing

D_{83}: to cause the actuated mechanism to move the first friction member from the release position towards the braking position;

D_{84}: a guide surface

D_{841}: curved

D_{842}: a first portion

D_{8421}: coincident with a cable clamp

D_{843}: a second portion

D_{8431}: extends from the first portion

D_{8432}: towards the cable support

D_{85}: the cable, when coupled to the cable clamp, approaches the guide surface from the opening in the cable support essentially tangent to the guide surface and is supported by the guide surface when the first friction member is in the release position.

Because of the nature of the prosecution history, the first and second cam members are grouped together as a single feature D_3 in the canceled claim, and the first cam D_5 and the second cam D_6 are given the same letter designation but with different subscript numbers of the same rank to illustrate how the first and second cams D_5 and D_6 have the same rank as the first and second cam members D_3. The actuating arm D_8 in reissue claim 37 is given the same letter designation with a different subscript number of the same rank to show how actuating arm D_8, which is still part of the actuated mechanism D, has the same rank as the first and second cam members D_3 as well as the first and second cams D_5 and D_6.

As applied to Shimano's first patentability issue, Shimano submits that any amendment or argument directed to a feature of a given rank in the canceled claim during prosecution is not germane to the elimination of a feature *above* that rank in a reissue claim. More specifically, the

elimination of feature D_3 in the canceled claim (or the equivalent features D_5 and D_6 in the patent claim) is not germane to any amendment or argument that resulted in the lower-ranked features D_{51}-D_{56} and D_{61}-D_{66} in the patent claim. As noted above, the *existence* of feature D_3 (or, for that matter, features D_5 and D_6) was not the issue in the prior art rejection. The patentability issues raised during prosecution of the original application were related to the characteristics of the lower-ranked features of D_3.

If it is held that the elimination of the first and second cams D_5 and D_6 is germane to the prior art rejection in the original application, then it is submitted that the broadening was related to actuated mechanism D, in which case the actuating arm D_8 added in the reissue claim represents a narrowing in the same area as the broadening (since actuating arm D_8 has the same rank as first and second cams D_5 and D_6), so Principle 3(a) does not bar the reissue claims pursuant to *Ball* and *Richman*, *supra*. Indeed, following the examiner's reasoning, it could be argued that the broadening was related to the cable disc brake recited in the preamble, in which case *any* narrowing amendment below the preamble would escape principle 3(a).

What is considered a broadening "germane" to a prior art rejection must stop somewhere, and it is submitted that what is considered a broadening "germane" to a prior art rejection is limited to a broadening of a feature having the same rank as a feature added or argued during prosecution. As applied to this case, that would mean keeping features D_5 and D_6 in the patent claim while broadening or eliminating a feature having a lower rank (i.e., features D_{51}-D_{56} and D_{61}-D_{66}).

As applied to Shimano's second patentability issue, because of the conversion of the input and output cams in the canceled claim into separate features, the claim chart is somewhat more complicated than the conceptual argument presented in Shimano's appeal brief, but the concepts still apply. In this case, the first and second cam members D_3 and the first and second cams D_5 and D_6 have the same rank, and the amendments and arguments made during prosecution were directed to features having a lower rank (i.e., features D_{51}-D_{56} and D_{61}-D_{66}). Features D_5 and D_6 were canceled and replaced with new feature D_8, and new feature D_8, together with sub-features D_{81}-D_{85}, materially narrow the claims to produce a distinct invention as noted at pages 11-14 of Shimano's brief.

Respectfully submitted,

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